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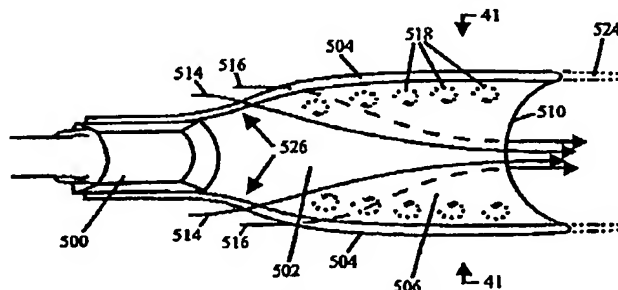
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- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: METHODS FOR CREATING LARGE SCALE BLADE DEFLECTIONS IN SWIM FINS



(57) Abstract: Methods are disclosed to design resilient hydrofoils (164) which are capable of having substantially similar large scale blade deflections under significantly varying loads. The methods permit the hydrofoil (164) to experience significantly large-scale deflections to a significantly reduced angle of attack under a relatively light load while avoiding excessive degrees of deflection under increased loading conditions. A predetermined compression range on the lee portion of said hydrofoil (164) permits the hydrofoil (164) to deflect to a predetermined reduced angle of attack with significantly low bending resistance. This predetermined compression range is significantly used up during the deflection to the predetermined angle of attack in an amount effective to create a sufficiently large leeward shift in the neutral bending surface with the load bearing portions of the hydrofoil (164) to permit the hydrofoil (164) to experience a significantly large increase in bending resistance as increased loads deflect the hydrofoil (164) beyond the predetermined reduced angle of attack. The shift in the neutral bending surface causes a significant increase in the elongation range required along an attacking portion of the hydrofoil (164) after the predetermined angle of attack is exceed. Methods are also disclosed for designing the hydrofoil (164) so that it has a natural resonant frequency that is sufficiently close the frequency of the reciprocating strokes used to attain propulsion in an amount sufficient to create harmonic wave addition that creates an amplified oscillation in the free end of the reciprocating hydrofoil (164). Methods are also disclosed for focusing energy storage and blade deflections along focused regions of load bearing members and the hydrofoil (164). Methods are also disclosed for reducing induced drag vortex formation along the lee surface of the hydrofoil (164), reducing drag and increasing the formation of lift forces.

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## INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 A63B31/11

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 284 765 A (W.W. HAFFENDEN LTD.) 9 August 1972 (1972-08-09)  page 2, line 24 - line 122; figures ---	1-28, 31-35, 37-72
X	FR 2 543 841 A (ROSSI LOUIS) 12 October 1984 (1984-10-12) page 4, line 10 - line 20; claims; figures ---	1,5-18, 56-72
X	US 4 007 506 A (RASMUSSEN PHILIP A) 15 February 1977 (1977-02-15) cited in the application claims; figures ---	1,21,29, 30
X	US 3 082 442 A (YVES COUSTEAU JACQUES ET AL) 26 March 1963 (1963-03-26) the whole document ---  -/--	1

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 810 629 A (PARR MICHAEL LANCASTER) 22 September 1998 (1998-09-22) -----	
A	US 3 411 165 A (MURDOCH FRANK N) 19 November 1968 (1968-11-19) cited in the application -----	

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Information on patent family members

International Application No

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